Industronics

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Servotron User Manual

For Versions up to S 3.14B

25 July, 2002

Note: As major menu structure changes where implemented in Version 3.15 this manual will remain current to serve Version 3.14B and earlier.

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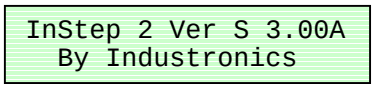
Overview

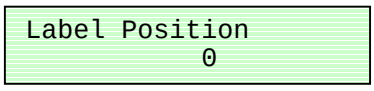
The Servotron is a fully integrated labelling head controller for Impresstik Labelling Machines. It includes a 400W servodrive to control the web drive servomotor. All of the adjustments are made with three pushbuttons on the front panel. There is a two line by twenty-character LCD display for viewing the settings. Settings can also be adjusted via a serial port if this option is installed.

Menu Structure

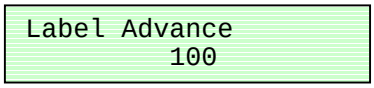


This is the opening screen. If Enter is pressed and held during this screen, the controller will display the initialisation menu. Refer to the end of this section for details.
If Enter is not pressed the following menu is displayed after a ten second delay:

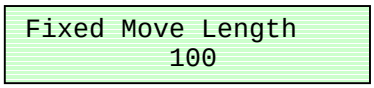
Level One Menus



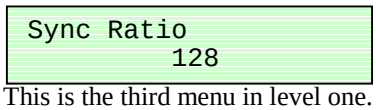
This is the first menu in level one. The Label Position setting is displayed here. This sets the delay in steps between the product sensor activation and the start of dispense effectively changing the position of the label on the product. Press Enter to enter Edit Mode, a flashing arrow is displayed to the right of the value when in edit mode. Whilst in edit mode the arrow keys can be used to adjust the value. When the correct value is displayed press Enter to leave Edit Mode. Whilst not in edit mode pressing the arrow keys moves to another menu item. Pressing the down arrow displays the following screen:



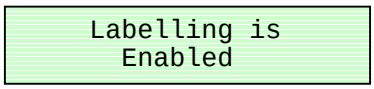
Or



This is the second menu in level one. The Label Advance or the Fixed Move length setting is displayed here. Which is displayed is determined by bit 7 in the Analogue Options menu in level three. The label advance menu sets the number of steps to move after the gap sensor has activated. If the deceleration is adjusted, this value must be entered again to subtract the deceleration steps from the entered advance value. The fixed move length menu sets the total length of the fixed move when that mode is selected. Both of these menus use the same memory location for value storage, so changing one changes the other. Pressing the down arrow displays the following screen:



This is the third menu in level one. (If the sync ratio has been set to 255 to ignore the master encoder, the Set Speed menu will be shown here otherwise the Sync Ratio setting is displayed here). This sets the sync ratio between the master encoder and the output pulse rate, 0 is 50%, 239 is 800%. A value of 255 causes the master encoder to be ignored and the set speed value to take effect. Always use 255 in a converted Monitor as no encoder connection is present. Pressing the down arrow displays the following screen:



This is the fourth menu in level one. Pressing Enter cycles between “Enabled” and “Disabled”. This menu is provided to allow for re-enabling after an ignored fault of to disable so that the product sensor is ignored or the roller can be turned by hand.

Other menus may appear here depending on the option card that has been fitted and which options have been enabled. Otherwise pressing the down arrow displays the following screen:

```
Level Two Menus
```

This is the fifth menu in level one. Pressing the down arrow displays the “Label Position” menu. Pressing Enter takes you to level two menus and displays the following screen:

Level Two Menus

```
Printer
        Off
```

This is the first menu in level two. The Printer setup is shown here. Pressing Enter cycles through the settings: Off, Moving Type and Stationary Type. Pressing the down arrow displays the following screen:

```
Manual Dispense
Press Enter to Start
```

This is the second menu in level two. Pressing Enter starts a label cycle. Pressing the down arrow displays the following screen:

```
Length Measure
```

This is the third menu in level two. Whilst this menu is displayed the actual dispensed label length is displayed at the completion of every cycle. Pressing the down arrow displays the following screen:

```
Missing Label Length
           5
```

This is the fourth menu in level two. If a label is dispensed and does not receive a gap sensor input before the number of steps set here the labeller will disable, show “Labeller error” and turn on the Missing Label and Bussed Fault Outputs. A value of 0 allows infinite length, 1 = 256, 2 = 512, 3 = 1024, 4 = 2048, 5 = 4096, 6 = 8192, 7 = 16384 and 8 = 32768 steps. Prior to Ver 3.06 Enabled = 8192 steps and Disabled = infinite. Pressing the down arrow displays the following screen:

```
Set Speed
           0
```

This is the fifth menu in level two. (If the sync ratio has been set to 255 to ignore the master encoder, the Sync Ratio menu will be shown here otherwise the Set Speed setting is displayed here). This is the dispense speed when no master encoder is used, i.e. Sync Ratio set to 255. Values less than 5000 give a very slow dispense speed, while values approaching 9999 give a very fast speed. Pressing the down arrow displays the following screen:

```
Two Label Spacing
           0
```

This is the sixth menu in level two. The Two Label Spacing setting is displayed here. This setting sets the number of steps to pause between the first and second label of a set. A value of 0 turns this function off. Pressing the down arrow displays the following screen:

```
2 Label 1st Advance
           0
```

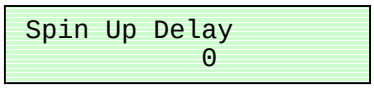
This is the seventh menu in level two. The advance setting for the first label of a two label set is displayed here. When two label spacing is turned on in the previous menu this setting controls the stopping position after the first label is dispensed. The normal advance setting is used for the second label. Pressing the down arrow displays the following screen:

```
Jig Delay
           0
```

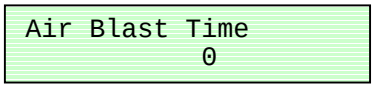
This is the eighth menu in level two. The Jig Delay setting is displayed here. This setting sets the number of steps between product sensor activation and the activation of the jig solenoid. A value greater than zero enables “Jig Control Mode”. Pressing the down arrow displays the following screen:

```
Jig Hold Delay
           0
```

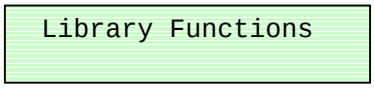
This is the ninth menu in level two. The Jig Hold Delay setting is displayed here. This setting sets the number of steps between the completion of the dispense and the deactivation of the jig solenoid. It is up to the operator to ensure correct product spacing. You must ensure the product is released before the following product is detected by the product sensor or that product will be ignored. This setting is only used when in Jig Control Mode which is enabled by the menu above, so you can leave the value in here when it is disabled. Pressing the down arrow displays the following screen:



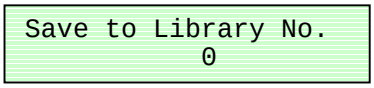
This is the tenth menu in level two. The Spin Up Delay setting is displayed here. This setting can enable one of two modes. In both modes the sequence is started by the "Jig In" input. A value of 1 puts the InStep into "Jig Only Mode". In this mode, the Jig In sensor simply triggers the normal cycle instead of the product sensor. When a larger value is entered, the "Orient Jig Mode" is turned on. This command sets the number of steps to pause before the registration scanner is enabled. This is to ensure the product is spinning in the jig at the correct speed. In orient jig mode the cycle is initiated by a sensor connected to the "Jig In" input. This initiates the spin up delay. When this is complete, the sensor connected to the "Colour Sensor" input is enabled. When the colour sensor sees a leading edge the normal dispense sequence is started. A value of 0 turns both jig modes off. Pressing the down arrow displays the following screen:



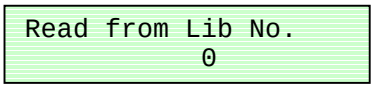
This is the eleventh menu in level two. The Air Blast Time setting is displayed here. This menu sets the air blast time in milliseconds. The air blast is for machines with an air box attachment. The air blast time occurs after the product delay and before the label starts to move. In version I 2.02 any value here causes a 64ms air blast time. Pressing the down arrow displays the following screen:



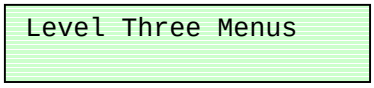
This is the twelth menu in level two. Pressing the down arrow displays the “Level Three Menus” selection screen further below. Pressing Enter takes you into the Library sub-menu and displays the following screen:



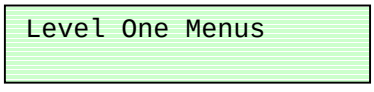
This is the first menu in the library sub-menu. Pressing Enter allows you to select the library number to save to. After selecting, pressing Enter saves all of the data from the current data memory and displays the “Library Functions” menu. Pressing the down arrow displays the following screen:



This is the second menu in the library sub-menu. Pressing Enter allows you to select the library number to read from. After selecting, pressing Enter reads the library and saves it to the current data memory. If after pressing Enter, the “Library Functions” menu is not displayed, the data in the selected menu was invalid. Select another library number or select 0 to escape from this menu. Pressing the down arrow displays the “Library Functions” menu.

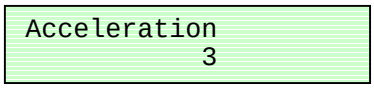


This is the thirteenth menu in level two. Pressing Enter takes you to level three menus and displays the “Acceleration” menu. Pressing the down arrow displays the following screen:

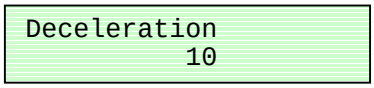


This is the fourteenth menu in level two. Pressing Enter takes you to level one menus and displays the "Label Position" menu. Pressing the down arrow displays the Printer menu.

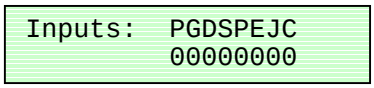
Level Three Menus



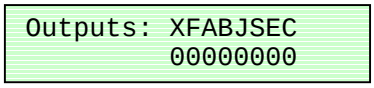
This is the first menu in level three. The Acceleration setting is displayed here. This menu selects one of six acceleration ramp profiles. A value of 5 is the softest, 3 is normal. Pressing the down arrow displays the following screen:



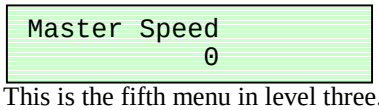
This is the second menu in level three. The Deceleration setting is displayed here. This menu adjusts the number of steps to decelerate for. This setting is read-only at present. Pressing the down arrow displays the following screen:



This is the third menu in level three. The input status is displayed here. A value of 1 indicates the input is on, 0 is off. The letters above the value indicate what the input is used for.
P – Product Sensor
G – Gap Sensor
D – Disable Input (Fault In)
S – Servo OK
P – Printer OK
E – End of Reel Input
J – Jig In / Product Gate Input
C – Colour Sensor
Pressing Enter updates display.
Pressing the down arrow displays the following screen:



This is the fourth menu in level three. The output status is displayed here. A value of 1 indicates the output is on, 0 is off. The letters above the value indicate what the input is used for.
X – Spare
F – Fault Output
A – Air Assist Output
B – Air Blast Output
J – Jig Solenoid Output
S – Feedscrew Enable Output
E – Servo Enable / Stepper Boost Output
C – Coder (Printer) Output
Pressing Enter updates display.
Pressing the down arrow displays the following screen:



This is the fifth menu in level three. The speed of the master encoder is displayed here. It is used to check the operation of the master encoder. The value shown is relative to the time between pulses on the master encoder input, so a small number represents a fast speed. Pressing Enter updates display. Pressing the down arrow displays the following screen:

```
Options: GSGEC421
         00000000
```

This is the sixth menu in level three. The option status is displayed here. A value of 1 indicates the option is on, 0 is off. The letters above the value indicate what the input is used for.
G – Gate Signal Required
S – Servo Mode (Not Stepper). On for speed compensation and servo enable. Off for stepper boost.
G – SIG drive compensation. Must select servo mode above as well.
E – Enable at Power On
C – Moving Type Coder (Not Stationary Type)
421 – Serial Address Select (Set bits to total to desired address)
Pressing Enter takes you into edit mode. The display counts up and down in binary.
Pressing the down arrow displays the following screen:

```
AnlgOut: FGIO?VCF
Options: 00000000
```

This is the seventh menu in level three. The analogue output option status is displayed here. The settings are only relevant if the Analogue Output Option Board has been fitted. A value of 1 indicates the option is on, 0 is off. The letters above the value indicate what the input is used for.
F – Fixed Pull Mode. This is different from InStep I fixed pull mode, it is triggered by the product scanner. This setting can be used with or without the Analogue Option board fitted.
G – Guarding closed input monitored.
I – Infeed Low Sensor monitored.
O – Outfeed High Sensor monitored.
? – Spare.
V – Vacuum Belt Speed Adjustment enabled.
C – Conveyor Speed Adjustment enabled.
F – Feedscrew Speed Adjustment enabled.
When the speed adjustments are disabled they are shutdown and the menu screens removed.
Refer to the Analogue Output Option Board manual for further details.
Pressing Enter takes you into edit mode. The display counts up and down in binary.
Pressing the down arrow displays the following screen:

```
Level Two Menus
```

This is the eighth menu in level three. Pressing Enter takes you to level two menus and displays the Printer menu. Pressing the down arrow displays the following screen:

```
Level One Menus
```

This is the ninth menu in level three. Pressing Enter takes you to level one menus and displays the Label Position menu. Pressing the down arrow displays the Acceleration menu.

Fault Screens

The following screens appear when the fault occurs. If the fault is rectified the screen can be cleared and the labeller re-enabled by presssing Enter. If you would like to review your settings without resetting, the first press of either arrow key will bring back the menu that was present before the fault occurred. You can then move around the menus as usual. Afterwards, you can re-enable the labelling by using the fourth menu in Level 1.

```
Labeller Error!
Press Enter to Reset
```

This screen indicates that the servomotor has moved too far in its search for the gap sensor activation. It is usually caused by a wrongly setup gap sensor or slipping drive rollers. It can always be reset immediately.

```
Printer Error!
Press Enter to Reset
```

Whenever the printer is enabled the printer fault signal is also enabled. The sense of the input is controlled by a bit in option port 2 or by the 'D' command. If no printer fault signal is available it should be set to off = OK. The fault signal must be removed to reset.
At present the input sense defaults to off = OK and the option port 2 is not available.

```
External Fault!
Press Enter to Reset
```

This screen appears when the Fault In input is activated. This input is edge triggered, so it can always be reset even though the fault may still be present. This input is usually tied together with all of the other Fault In/Fault Outs on the machine so that a fault on one label head will disable all heads.

```
Servodrive Error!
Press Enter to Reset
```

This screen appears when the connected servo drive has indicated a fault. You usually must power down the servodrive to reset the fault. If the fault occurs often it will be necessary to open the enclosure to check the fault code indicated on the front of the servodrive. Refer to the servodrive manual for the fault codes meaning and its remedy. It is usually caused by a web jam up.

```
End of Label Reel!
Press Enter to Reset
```

This screen appears when the sensor connected to the End of Reel input is on. It is usually a sensor setup to detect a low quantity of labels on the unwind reel.

Other fault screens may appear depending on the option card fitted and which functions are enabled.

Initialisation Menu

This menu can only be entered during power up. It will automatically appear if the controller detects invalid data in the current data memory or it can be forced to appear if Enter is pressed and held during the initial screen that displays the version number information. It will appear as either of the two following screens:

```
   Enter Pressed
Use ^ to make choice
```

or

```
EEPROM Data Invalid!
Use ^ to make choice
```

If the up arrow is pressed, the following screen will appear:

```
   Enter Pressed
  Erase Libraries
```

This is the first choice in the initialisation menus. Pressing Enter causes all of the Library data to be erased then the first initialisation menu is shown again. Pressing the up arrow causes the next menu to be displayed as follows:

```
   Enter Pressed
   Reinitialise?
```

This is the second choice in the initialisation menus. Pressing Enter causes all of the current data to be reset to default values and then display the first menu in level one. Because of this, if you want to erase libraries and reinitialise you must erase libraries first. Pressing the up arrow causes the next menu to be displayed as follows:

```
Enter Pressed
  Do Nothing
```

This is the third choice in the initialisation menus. Pressing Enter simply displays the first menu in level one and as the menu suggests, does nothing. If the entry into the initialisation menus was caused by invalid data you can't use this option, but must select reinitialise. Pressing the up arrow causes the first initialisation menu to be redisplayed.

Inputs

All inputs are found on connector CONN1. They are selectable by jumpers on the InStep II PCB for NPN (1 to 2) or PNP (2 to 3) input devices. The function of each input follows.

IN1 – Colour Sensor (Product Sensor 2)

This input only functions in Orientation Mode. It triggers the labelling cycle just as the normal product scanner does but only after the orient part of the cycle is complete. See jumper J1 for input polarity selection. Terminal 1 on CONN1.

IN2 – Jig In Sensor/Product Gate

This input is usually a proximity detector mounted on the orientation jig to indicate when the jig is closed. It initiates the spin up delay in orient jig mode. If the Gate Input is selected on the option port this input becomes the product sensor gate input. In this mode this input must be on before a product detection will start the dispense cycle. See jumper J2 for input polarity selection. Terminal 2 on CONN1.

IN3 – Fixed Pull Input/End of Reel

This input is marked "Fixed Pull" as this was its use prior to Ver 3.04. Now this input is usually connected to a sensor that detects a low level of labels on the unwind reel. When this input is on labelling is disabled and the End of Reel screen is displayed. See jumper J3 for input polarity selection. Terminal 3 on CONN1.

IN4 – Printer OK

This input is connected to the printer OK/fault output of the printer controlled by the InStep module. When the printer is enabled by the printer menu or the 'D' command with an odd value this input must be on otherwise labelling is disabled and the "Printer Error" is displayed. If an even value is used in D the input must be off for printer OK. See jumper J4 for input polarity selection. A bit in Option Port 2 will also control the polarity in the future. Terminal 4 of CONN1.

IN5 – Servodrive OK

This input is connected internally to the servodrive fitted inside the Servotron. It disables labelling and shows a fault screen when it is off. When a Mitsubishi drive is fitted the polarity jumper J5 should be set to NPN. This input is not brought out to the rear panel connectors.

IN6 - Disable (Bussed Fault In)

This input disables the labelling on a transition from off to on. Even if the input is left on the unit may be re-enabled via the Labeling menu or the "E1" command. See J6 for input polarity selection. Terminal 5 on CONN1.

Product - Product Sensor

This input initiates the labelling sequence. It starts with a transition from off to on of this input. See jumper J7 for input polarity selection. Terminal 8 on CONN1.

Gap Sens - Gap Sensor

This is the registration input. It is normally connected to a fork sensor that detects the gap between the labels on the backing paper. The label advance starts counting with an off to on transition of this input. See jumper J8 for input polarity selection. Terminal 9 on CONN1.

Encoder - Master Encoder

This is where the encoder for the product speed is connected. The encoder is usually coupled to the conveyor or vacuum belt of the machine. See jumper J12 and J13 for input polarity selection and J11 for voltage. The pulses per rev of the encoder and its gearing to the conveyor / belt should be selected so that the rate is the same as the step rate of the motor. It is best to be on the low side of one to one if this cannot be achieved. The encoder should have an open collector 5 or 24VDC output. Terminal 10 on CONN1.

Outputs

All outputs are found on connector CONN2. They are selectable for NPN or PNP however they must all be one or the other. Selection is made by changing IC9. For NPN use ULN2803A, for PNP use UDN2981A. Jumpers J9 and J10 must be set to suit.

OUT1 – Coder (Printer)

This output is the start trigger for a date coder etc. Option Menu selects whether the coder is of the type that prints while the web is stationary (e.g. hot stamp) or moving (e.g. ink jet). Terminal 1 on CONN2.

OUT3 – Feedscrew Enable/Servotron OK Output (Mislab Out)

This output terminal is marked “Mislab Out” on the rear panel as this was its purpose prior to V3.08. As of V3.08 this output is provided to enable the feedscrew. It is on whenever there are no faults and no level pauses from the high outfeed and low infeed sensors. As of version S3.14 this output becomes an OK output whenever the level control are not enabled in the Analogue setup. It is on whenever there are no faults present. The analog output option board is required for the level sensor inputs. Terminal 2 on CONN2.

OUT4 – Jig Solenoid

This output controls the solenoid which closes the orient jig. Implemented in V3.02. Pin 3 on CONN2.

OUT5 – Air Blast

When an air blast time is entered in the menu or with the K command, this output is turned on at the end of the product delay and before the servo starts to move. Terminal 6 on CONN2.

OUT6 – Air Assist

This output is turned on at the start of the servo moving and off at the beginning of deceleration. Terminal 7 on CONN2.

OUT7 – Bussed Fault Out

This output is turned on when there is a labeler fault, printer fault, servo fault, end of reel or Fault In is on. It only goes off when the fault has been reset or labelling is re-enabled. Terminal 8 on CONN2.

Connectors

Rear Panel Connector CONN1 - Inputs

Pin Number	Signal	Description
1	IN1	Product Sensor 2. Registration mark scanner, used in orient jig mode.
2	IN2	Jig In/Product Gate input. Use depends on selected mode.
3	IN3	End of Reel input. On causes End of Reel fault.
4	IN4	Printer OK input. On or Off for OK selectable.
5	IN6	External Fault input. Possibly from other Servotrons.
6	+24V	24V provided for sensor power.
7	0V	0V provided for sensor power.
8	PROD	Product detection scanner input.
9	GAP	Label gap scanner input.
10	ENC	Master encoder input. 24 or 5 volt jumper selectable.
11	+5V	5V provided for encoder power
12	0V	0V provided for encoder power

Rear Panel Connector CONN2 - Outputs

Pin Number	Signal	Description
1	OUT1	Printer output. Moving or stationary type selectable.
2	OUT3	Feedscrew Enable output. Turned on when labelling enabled and no level pause.
3	OUT4	Jig Solenoid Output. Connects to solenoid that controls orientation jig closure.
4	+24V	24 volt power supply for output devices.
5	0V	0 volt power supply for output devices.
6	OUT5	Air Blast output. Connects to air blast solenoid
7	OUT6	Air Assist output. Connects to air assist solenoid
8	OUT7	Fault output. Turned on when fault detected. Can be chained to other units
9	+24V	24 volt power supply for output devices.
10	0V	0 volt power supply for output devices.
11	OPT1	Depends on option card fitted. Refer Option Card manual
12	OPT2	Depends on option card fitted. Refer Option Card manual

Rear Panel Connector CONN3 is used for connection to the option card, if fitted. For terminal descriptions, refer to the appropriate Option Card manual.

Rear Panel Connector CONN4 – Motor Power

Pin Number	Signal	Motor Cable Colour	Intermediate Cable Colour
1	Motor U	Red	Brown
2	Motor V	White	Black
3	Motor W	Black	Blue
4	Earth	Green/Yellow	Green/Yellow

Configuration

InStep II PCB Jumper Descriptions

Jumper	Description	Default
J1 to J8	These three point jumpers select the polarity of the signal required to operate the inputs. Jump 1 to 2 for sinking (NPN) type input devices. Jump 2 to 3 for sourcing (PNP) type input devices. J1 to J6 correspond to input 1 to 6 respectively. J7 is for the product sensor input. J8 is for the label sensor input.	1 to 2 jumpered (J5 should always be set to 1 to 2 when a Mitsubishi drive is fitted!)
J9 and J10	These jumpers are set to match the type of output driver IC installed in position IC9. Jump both 1 to 2 for NPN type IC (ULN2803A) Jump both 2 to 3 for PNP type IC (UDN2981A) Note: jumpers must be set correctly or damage will result!	1 to 2 jumpered
J11	Install Jumper 11 when 5 volt encoder is used. J12/13 must be in PNP configuration when this jumper is installed!	Not fitted
J12 and J13	These jumpers are set to match the polarity of the output of the master encoder connected to terminal 11. Jumper J12 and J13 1 to 2 for NPN output encoders. Jumper J13 2 to 3 and J12/1 to J13/1 for PNP output encoders.	J12, 1 to 2 jumpered J13, 1 to 2 jumpered
J14 to J24	These jumpers set the master encoder divisor. J14 is divide by one, J15 is divide by 2 through to J24 which is divide by 1024. Only one jumper in this set to be installed!	J14 installed
J25	Selects the function on pin 28 on P1. Refer to option manual.	1 to 2 jumpered
J26	Selects whether to bypass the encoders optocoupler. 1 to 2 is to use optocoupler, 2 to 3 is to bypass the optocoupler.	1 to 2 jumpered

Rear Panel PCB Jumper Descriptions

Jumper	Description	Default
J1	This jumper adapts the inputs of the servodrive to the outputs of the InStep II PCB. It should be set to match the output IC fitted on it. Jump 1 to 2 for NPN, 2 to 3 for PNP.	1 to 2 jumpered
J2	This jumper selects the direction of the servomotor. Jump 1 to 2 for CW, 2 to 3 for CCW.	2 to 3 jumpered

LCD Contrast

Near the bottom corner of the InStep II PCB there is a small adjustment potentiometer to adjust the liquid crystal displays contrast. The display contrast is directly affected by the ambient temperature and as such may require adjustment in extreme temperature environments.

Servodrive Parameters

The Servotron usually comes fitted with a Mitsubishi MR-C40A servodrive. The parameters of this drive are set at manufacture. If it becomes necessary to alter or reload them please consult Impresstik Machinery Pty Ltd.

AC Input Socket

The AC power input module takes an IEC style power cable. The fuse fitted inside this module should be a 5 amp Antisurge (T) rated type. The input voltage is determined by the servodrive fitted inside, this is 200 to 240Vac 50/60Hz for the Mitsubishi. If no servo is fitted inside the box the input voltage range is 85 to 265Vac, 47 to 63Hz.

InStep Labelling Modes and Sequence Chart

Step No.	Step	Comments
1	Product Input On	All modes except Jig Only/Orient and Man Dispense
2	Product Gate Input On[1]	Only if selected on option port (InStep I J31 or InStep II bit 7)
3	Jig Delay	Jig Control Mode Only[2] (Jig Delay > 0)
4	Jig Solenoid Output On	Jig Control Mode Only (Jig Delay > 0)
5	Jig In Input Off[3,4] (Jig In)	Jig modes only (Jig Only/Orient Mode starts here) (S U D > 0)
6	Spin Up Delay[5]	Orient jig mode only (Spin Up Delay > 1)
7	Colour Sensor/Prod 2 Input[6]	Orient jig mode only (Spin Up Delay > 1)
8	Label Position Delay	All modes except manual release
9	Air Blast Output On	Air Blast Mode Only (Man Dispense starts here) (AB Time > 0)
10	Air Blast Time	Air Blast Mode Only (Air Blast Time > 0)
11	Air Blast Output Off	Air Blast Mode Only (Air Blast Time > 0)
12	Air Assist Output On	All modes
13	Acceleration	All modes (Except 2nd label of two label set as of V3.07)
14	Printer Output Off/On	Only if Printer enabled (D > 1) (Off/On selected on option port)
15	Run in Sync or Set Speed	All modes
16	Gap Sensor Input On	All modes
17	Label Advance[7]	All modes (Gets setting from t command on 1st label of 2 label)
18	Air Assist Output Off	All modes
19	Two Label Spacing Delay	Two Label Mode Only (Two Label Spacing > 0)
20	Back to step 9 on first pass	Two Label Mode Only (Two Label Spacing > 0)
21	Deceleration	All modes (Prior to V1.18C was done on 1st label of 2 label set)
22	Jig Hold Delay	Jig Control Mode Only (Jig Delay > 0)
23	Jig Solenoid Output Off	Jig Control Mode Only (Jig Delay > 0)
24	Printer Output On/Off	Only if Printer enabled (D > 1) (Off/On selected on option port)
25	Product Input Enabled	Only if labelling still enabled (E = 1)

[1] If selected, the Gate Input must be on at the instant of the product sensor coming on or the sequence will restart. Therefore, the timing is always controlled by the Product Sensor Input.
[2] When using Jig Control Mode you must select either Jig Only or Orient Jig Mode as well. If not, the sequence will stall after the Jig Solenoid is turned on.
[3] The sense of the Jig In Sensor Input has been changed so that off = jig in. This was done to allow the use of a more standard N.O. proximity sensor in the orient jig mechanism.
[4] Because the Product Gate and Jig In share the same input, it is not practical to have both enabled at the same time. However, this is not normally a limitation as gating is usually only used on a rotary type machine where an orientation jig cannot be fitted
[5] The Spin Up Delay is used to ensure the product is spinning smoothly in the jig before the Colour Sensor/Prod 2 is enabled. This prevents false triggers from the Colour Sensor.
[6] Sending anything over serial port while waiting for the colour sensor input to be activated will cause the sequence to reset without dispensing.
[7] In Fixed pull mode steps 15 and 16 are bypassed and the advance is loaded with the fixed pull length minus the acceleration length. It is not intended that it be used in conjunction with the jig modes or two label mode.

Servotron Version Update Summary

Version S 3.04 - 25/08/2000

Changes: First released version.
Fixes: None.
Additions: Adds End of Reel fault. Input on IN3 (old Fixed In). This function is only available on the Servotron version of the software. As it uses the Fixed In input this function is no longer available although it may be made optional in the future.

Version S 3.05 - 11/09/2000

Changes: None.
Fixes: Fixed problem when Air Blast enabled, it occasionally caused Servo Enable to go off. Also changed offset of Set Speed so that 9999 doesn't cause a speed higher than can be output.
Additions: None.

Version S 3.06 - 08/11/2000

Changes: None.
Fixes: Acceleration now goes through all accel steps at every speed. Corrects changing product delay with changing speed.
Additions: Adjustable missing label. Ability to select SIG speed compensation table at compile time.

Version S 3.07 - 12/12/2000

Changes: Changed function of J29 from 2x input freq to SIG speed compensation table select. Changed range of 'X' command to max 2FF hex. to access all of RAM.
Fixes: None.
Additions: Added 't' command to select a different advance for the first label of a two label set. Removed acceleration from start of second label of two label set to allow for proper two label spacing. No Servotrons were made with this version!

Version S 3.07A - 03/01/2001

Changes: None.
Fixes: Made some branching alterations to programme to suit addition below.
Additions: Added 2 Label 1st Advance menu to Servotron version.

Version S 3.08 - 27/03/2001

Changes: None.
Fixes: Now stepper boost works when manual dispensing in stepper mode.
Servo disable now occurs irrespective of product sensor status.
Additions: Added support for Analogue Output Option board. Put in Analog options menu, three speed menus and high outfeed pause screen. Conveyor speed uses feedscrew value.

Version S 3.07B - 27/03/2001

Changes: Changed SIG speed compensation tables top two values too give more compensation. This is based on 3.07, but this new table will be included in subsequent versions.
Fixes: None.
Additions: None.

Version S 3.09 - 12/04/2001

Changes: Changed bit 7 in Analogue options to select fixed pull mode. Has updated SIG speed compensation table selected like V 3.07B.

Fixes: Fixed library in conjunction with new analogue settings. They were not updated when a new library was selected. Selecting the new library then cycling power worked! Fixed Input menu to show new end of reel sensor as A and new SIG speed compensation select in option menu now shows as G.

Additions: Added a new fixed pull mode which is different from the InStep I version. It is triggered by the product scanner and has a new menu to enter the value but the value is actually stored in the advance memory register.

Version S 3.10 - 27/04/2001

Changes: Now there are only five libraries (previously six). This is to allow for addition below.

Fixes: X and x commands now reject ASCII characters above 'F'. Done mainly to reject lowercase a to f.

Additions: Finalised conveyor analogue output. Previously used feedscrew value.

Version S 3.10A - 02/05/2001

Changes: Gap sensor now enabled at start of dispense, not at end of accel. This allows smaller labels or longer advances than previously.

Fixes: Changed writes to analogue option board to minimise chance of bad writes causing DAC shutdown.

Additions: None.

Version S 3.11 - 08/05/2001

Changes: None.

Fixes: Fixed manual dispense where prod sensor still activated following automatic dispense.

Additions: None.

Version S 3.11C and D - 21/05/2001

Changes: Special versions for tube labeller and paper roll labeller with applicator arm.

Fixes: None.

Additions: None.

Version S 3.12 - 07/06/2001

Changes: None.

Fixes: Fixed several problems with high outfeed. Setting it on in Analogue Options menu used to cause menu to jump away to previous one, now fixed. Also you can now move out of the high outfeed screen while high outfeed is still present.

Additions: None.

Version S 3.12A - 15/06/2001

Changes: None.

Fixes: Fixed problem where if a serial "E1" command was sent during a dispense it would cause a missing label fault. "E1" command now rejected if already enabled. (Returns [BELL]?).

Additions: None.

Version S 3.12B - 28/06/2001

Changes: An External fault (Bussed fault in) can no longer be reset while the fault is still present.

Fixes: None.

Additions: None.

Version S 3.12C - 21/07/2001

Changes: None.
Fixes: Fixed problem introduced in 12B where needed two reset enables to recover from bussed fault if they were tied together (as in most InStep I's). Added time delay after reset.
Additions: None.

Version S 3.12D - 24/08/2001

Changes: None.
Fixes: Fixed problem in jig control mode. Product sensor was enabled before jig out input on.
Additions: None.

Version S 3.13 - 10/09/2001

Changes: Improved master following through master stop and re-start. Top byte of master speed received through serial port is now the number of output pulses per input pulse leftover.
Fixes: None.
Additions: None.

Version S 3.14 - 02/10/2001

Changes: Fault Out now comes on with Fault In.
Fixes: None.
Additions: Added Servotron OK output. If level controls not enabled in "Analogue Options" then the Feedscrew Enable output serves as a "Servotron OK" output. It is on when no faults exist.

Version I 3.14A - 19/10/2001

Changes: None.
Fixes: Fixed problem where if first attempted dispense was made with master encoder stopped it would dispense at very slow speed. (Starting master encoder fixes it till InStep turned off).
Additions: None.

Version I 3.14B – 15/11/2001

Changes: None.
Fixes: Fixed problem present since 3.13 where motor stutters occasionally.
Additions: None.